UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P O Box 1450
Alexandria, Virginia 22313-1450
www uspto gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,493	04/20/2006	Masahiko Yoshida	Q93289	3748

72875 7590 01/11/2010
SUGHRUE MION, PLLC
2100 Pennsylvania Avenue, N.W.
Washington, DC 20037

EXAMINER	
KAU, STEVEN Y	

ART UNIT	PAPER NUMBER
2625	

NOTIFICATION DATE	DELIVERY MODE
01/11/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USPTO@sughrue.com
kghyndman@sughrue.com
USPatDocketing@sughrue.com

Office Action Summary	Application No.	Applicant(s)	
	10/576,493	YOSHIDA, MASAHIKO	
	Examiner	Art Unit	
	STEVEN KAU	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 October 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26,28 and 29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26,28 and 29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 April 2009* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/7/2009 has been entered.

Status of the Claims

Claim 27 has been canceled. Claims 1-26 and 28-29 are pending for further examination in this Action.

Response to Remark/Arguments

Applicant's arguments with respect to claims 1-29 have been fully considered but are moot in view of the new ground(s) of rejection (or and the reply to the Remarks/Arguments is in the following:)

- Applicant's arguments, "Claim Rejections Under 35 U.S.C. § 101", Page 17, Remarks, 10/7/2009, with respect to claim 27 have been fully considered and are persuasive. The rejection of claim 27 under 35 U.S.C.

§ 101 has been withdrawn from the record because the cancellation of claim 27.

- Applicant's arguments with respect to the rejection of claims 1-5 under 35 U.S.C. 103(a) have been fully considered and are not persuasive. Thus, same ground of rejection is remained and still stands. Reply to applicant's remarks/arguments is discussed below.

Applicant's arguments, "Moreover, without conceding to the merits of the Examiner's rejections, claim 1 has been amended, as set forth above, to recite (among other things):

'...printing a correction pattern by ejecting ink from a plurality of nozzles.., and forming.., a plurality of lines.., a first one of the plurality of lines formed with a first one of the plurality of nozzles being adjacent to a second one of the plurality of lines formed with a second one of the plurality of nozzles;

obtaining correction values that respectively correspond to the lines by measuring a darkness of the correction pattern line by line;

storing the correction values for the lines, respectively...'

The cited references, and any combination thereof, fail to teach or suggest all the recitations of claim 1 and, therefore, claim 1 is patentable for at least these reasons.

According to claim 1, correction values that respectively correspond to the lines are obtained, and the correction values for the lines are respectively stored. The

Examiner acknowledges that Inoue fails to teach or suggest these features, but alleges that Wada remedies the deficient teachings of Inoue. Applicant respectfully disagrees.

In sharp contrast to claim 1, in Wada, the density of each line corresponds to each nozzle, and the density of each line is converted into an amount of ink discharged in a single discharge operation of the nozzle (Wada, column 18, lines 38-42). For example, according to Wada, in a case where Nozzle #1 is used to form line #1 and line #100 during print operation, the same correction for Nozzle #1 is made for correcting both line #1 and line #100."

In re, the Examiner respectfully disagrees with the above arguments. As discussed in the previous Action, i.e. dated 7/2/2009, prior arts Inoue et al '688 reference combines with Wada et al '178 reference teach the above mentioned claim limitations. With respect to claim 1, limitations recite, "printing a correction pattern by ejecting ink from a plurality of nozzles moving in a predetermined movement direction and forming, in an intersecting direction intersecting the movement direction, a plurality of lines extending along the movement direction and constituted by a plurality of dots, a first one of the plurality of lines formed with a first one of the plurality of nozzles being adjacent to a second one of the plurality of lines formed with a second one of the plurality of nozzles; obtaining correction values that respectively correspond to the lines by measuring a darkness of the correction pattern line by line; storing the correction values for the lines, respectively; and printing the image with a plurality of the lines

formed in the intersecting direction, while correcting the darkness of each line in accordance with the correction values each corresponding to the darkness of each of the measured lines." The invention of the claim is not distinct from the prior arts Inoue et al '688 reference combines with Wada et al '178 reference. In other words, the claim limitations are obvious to prior art Inoue et al '688 reference in view of Wada et al '178 reference. For instance, Inoue '688 discloses a printing method for printing an image onto a medium, the method comprising: printing a correction pattern **(referring to Fig. 8, an example of density correcting patterns)** by ejecting ink from a plurality of nozzles moving in a predetermined movement direction and forming, in an intersecting direction intersecting the movement direction **(referring to Figs. 6 and 7, print head, i.e. nozzles move in forward and backward direction, i.e. a predetermined direction as shown in the figure, col 6, lines 1-18, and cloth feeding direction is intersecting the movement direction of nozzles as shown in Fig. 7, col 6, lines 1-18; and image is printed in the intersection direction to the movement direction of print head, or nozzles, col 5, lines 48-61)**, a plurality of lines extending along the movement direction and constituted by a plurality of dots **(referring to Figs. 2, 6 and 8, col 7, line 66 to col 8, line 29)**, to print a correction pattern **(i.e. referring to Fig. 8, example of density correcting patterns, and printing a pattern with correction data, col 2, lines 55-60)**; obtaining correction values that respectively correspond to the lines by measuring a darkness **(i.e. density levels like gradation values)** of the correction pattern line by line **(i.e. the density of gradation part of printed image data is measured and the correction table of one band, col 7, lines 15-28; and density**

correction table is formed for each nozzle, and one nozzle can only deposit inks for one line, col 7, line 57-62; that is, correction value must be obtained nozzle by nozzle, or line by line); and printing the image with a plurality of the lines formed in the intersecting direction (**referring to Figs. 2, & 6-11, image is printed in the intersection direction to the movement direction of print head, or nozzles, col 5, lines 48-61**), while correcting the darkness of each line in accordance with the correction values each corresponding to the darkness of each of the measured lines (**i.e. different gradation values, i.e. density value, reflect different darkness, i.e. gradation values 0 to 255 and 255 is completely white, col 8, line 64 to col 9, line 4, and col 1, lines 12-46, and col 2, lines 37-67**).

Inoue '688 does not disclose that a first one of the plurality of lines formed with a first one of the plurality of nozzles being adjacent to a second one of the plurality of lines formed with a second one of the plurality of nozzles; storing the correction values for the lines.

in the same field of endeavor, Wada '178 teaches that a first one of the plurality of lines formed with a first one of the plurality of nozzles being adjacent to a second one of the plurality of lines formed with a second one of the plurality of nozzles (**referring to Figs. 8- 13, disclose lines are formed with a plurality of nozzles, i.e. first, second and third lines [i.e. lines are formed with a plurality of dots] are formed with first, second and third nozzles**); storing the correction values for the lines (**i.e. memory means for storing a calibration line representing correlation between an amount of ink discharged and a density of an ink dot formed, col 5, lines 5-14**).

Inoue ‘688 reference and Wada ‘178 reference are combinable because both references are in the same field of endeavor of teaching correction of amount of ink discharged by the print head. And the motivation for doing so would have been to improve the efficiency of the printing system for line density, or ink amount, or darkness measurement with respect to individual line (col 2, line 20-32) and thus for the line calibration or correction for better image quality reproduction (col 2, lines 52 to col 3,line 11), and further the services provided could easily be established for one another with predictable results. Therefore, the above arguments, as well as the arguments in Remarks are not persuasive, and the examiner believes the rejection made was proper, and the same ground of rejection still stands.

In addition, Specifically in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., “***On the other hand, according to illustrative embodiments consistent with claim 1, even in the case where Nozzle #1 is used to form line #1 and line #100 during print operation, a first correction value that corresponds to line #1 is used for correcting line #1, and a second correction value that corresponds to line # 1 00 is used for correcting line # 100. Thus, consistent with illustrative embodiments of claim 1, the correction value that corresponds to line #1 and the correction value that corresponds to line # 1 00 may be different from each other***”, page 19, Remarks, 10/7/2009) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns,* 988

F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The examiner also references the applicant to the claims rejection section below for the explanation on how the prior art references read on the amended claims.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-6, 15-23 and 25-29 rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al (US 6,354,688 in view of Wada et al (US 6,270,178).

Regarding claim 26.

Inoue discloses A printing system (**i.e. the system of Figs. 1 and 22**), comprising: a computer (**i.e. external calculating device 2 or a computer of Figs. 1 and 22, col 3, lines 60-67**); and
a printing apparatus connected communicably to the computer (**i.e. Printer 1 and computer 2 of Figs. 1 and 22, col 3, lines 60-67**); the printing apparatus including: nozzles for ejecting ink (**i.e. printer head has nozzles for effective printing, col 4, lines 27-37**); and a controller (**i.e. print control device 15 of Fig. 1, col 4, lines 1-10**) for making a plurality of the nozzles that move in a predetermined movement direction eject ink to form (**i.e. referring to Figs. 6 and 7, print head, i.e. nozzles move in**

forward and backward direction, i.e. a predetermined direction as shown in the figure, col 6, lines 1-18), in an intersecting direction intersecting the movement direction (**i.e. cloth feeding direction is intersecting the movement direction of nozzles as shown in Fig. 7, col 6, lines 1-18)**, a plurality of lines extending along the movement direction and constituted by a plurality of dots (**i.e. referring to Figs. 2, 6 and 8, col 7, line 66 to col 8, line 29)**, to print a correction pattern (**i.e. referring to Fig. 8, example of density correcting patterns, and printing a pattern with correction data, col 2, lines 55-60)**, the controller obtaining correction values (**i.e. the density of gradation part of printed image data is measured and the correction table of one band, col 7, lines 15-28)** that respectively correspond to the lines by measuring a darkness (**i.e. density levels like gradation values)** of the correction pattern line by line (**i.e. the density of gradation part of printed image data is measured and the correction table of one band, col 7, lines 15-28; and density correction table is formed for each nozzle, and one nozzle can only deposit inks for one line, col 7, line 57-62; that is, correction value must be obtained nozzle by nozzle, or line by line)**; the controller stores the correction values (**i.e. Processing Parameter Storage 16 of Fig. 1 stores gamma and density correction table, col 4, lines 48-53)**, the controller printing the image with a plurality of the lines formed in the intersecting direction (**i.e. referring to Figs. 2, 6, 7 and 8, image is printed in the intersection direction to the movement direction of print head, or nozzles, col 5, lines 48-61)**, while correcting a darkness of each of the lines (**referring to Figs. 2, 6-11, density unevenness for lines are to be corrected and correction table is form**

for each nozzle; that is, density correcting must be performed nozzle by nozzle, or line by line, col 7, lines 57-62) in accordance with correction values each corresponding to a darkness of each line in the correction pattern (**i.e. different gradation values, i.e. density value, reflect different darkness, i.e. gradation values 0 to 255 and 255 is completely white, col 8, line 64 to col 9, line 4, and col 1, lines 12-46, and col 2, lines 37-67**).

Inoue does not disclose that a first one of the plurality of lines formed with a first one of the plurality of nozzles being adjacent to a second one of the plurality of lines formed with a second one of the plurality of nozzles; and the controller storing the correction values for the lines.

In the same field of endeavor, Wada teaches that a first one of the plurality of lines formed with a first one of the plurality of nozzles being adjacent to a second one of the plurality of lines formed with a second one of the plurality of nozzles (**referring to Figs. 8- 13, disclose lines are formed with a plurality of nozzles, i.e. first, second and third lines [i.e. lines are formed with a plurality of dots] are formed with first, second and third nozzles**); and the controller storing the correction values for the lines, respectively (**i.e. memory means for storing a calibration line representing correlation between an amount of ink discharged and a density of an ink dot formed, col 5, lines 5-14**).

Inoue '688 reference and Wada '178 reference are combinable because both references are in the same field of endeavor of teaching correction of amount of ink discharged by the print head.

Having a printing system of Inoue' 688 reference and then given the well-established teaching of Wada' 178 reference, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the printing system of Inoue' 688 reference to include "a first one of the plurality of lines formed with a first one of the plurality of nozzles being adjacent to a second one of the plurality of lines formed with a second one of the plurality of nozzles; and the controller storing the correction values for the lines" as taught by Wada' 178 reference. The motivation for doing so would have been to improve the efficiency of the printing system for line density, or ink amount, or darkness measurement with respect to individual line (col 2, line 20-32) and thus for the line calibration or correction for better image quality reproduction (col 2, lines 52 to col 3, line 11), and further the services provided could easily be established for one another with predictable results.

Regarding claim 25.

Claim 25 is directed to a printing apparatus claim which substantially corresponds to the operation of the device in claim 26, with identical features corresponding directly to the function of device elements in claim 26. Thus claim 26 is rejected as set forth above for claim 26.

Regarding claim 1.

Inoue '688 discloses a printing method for printing an image onto a medium, the method comprising:

printing a correction pattern (**referring to Fig. 8, an example of density correcting patterns**) by ejecting ink from a plurality of nozzles moving in a predetermined

movement direction and forming, in an intersecting direction intersecting the movement direction (**referring to Figs. 6 and 7, print head, i.e. nozzles move in forward and backward direction, i.e. a predetermined direction as shown in the figure, col 6, lines 1-18, and cloth feeding direction is intersecting the movement direction of nozzles as shown in Fig. 7, col 6, lines 1-18; and image is printed in the intersection direction to the movement direction of print head, or nozzles, col 5, lines 48-61**), a plurality of lines extending along the movement direction and constituted by a plurality of dots (**referring to Figs. 2, 6 and 8, col 7, line 66 to col 8, line 29**), to print a correction pattern (**i.e. referring to Fig. 8, example of density correcting patterns, and printing a pattern with correction data, col 2, lines 55-60**); obtaining correction values that respectively correspond to the lines by measuring a darkness (**i.e. density levels like gradation values**) of the correction pattern line by line (**i.e. the density of gradation part of printed image data is measured and the correction table of one band, col 7, lines 15-28; and density correction table is formed for each nozzle, and one nozzle can only deposit inks for one line, col 7, line 57-62; that is, correction value must be obtained nozzle by nozzle, or line by line**); and printing the image with a plurality of the lines formed in the intersecting direction (**referring to Figs. 2, & 6-11, image is printed in the intersection direction to the movement direction of print head, or nozzles, col 5, lines 48-61**), while correcting the darkness of each line in accordance with the correction values each corresponding to the darkness of each of the measured lines (**i.e. different gradation values, i.e. density value, reflect different darkness, i.e. gradation values 0 to 255 and 255 is**

completely white, col 8, line 64 to col 9, line 4, and col 1, lines 12-46, and col 2, lines 37-67).

Inoue ‘688 does not disclose that a first one of the plurality of lines formed with a first one of the plurality of nozzles being adjacent to a second one of the plurality of lines formed with a second one of the plurality of nozzles; storing the correction values for the lines.

in the same field of endeavor, Wada ‘178 teaches that a first one of the plurality of lines formed with a first one of the plurality of nozzles being adjacent to a second one of the plurality of lines formed with a second one of the plurality of nozzles (**referring to Figs. 8- 13, disclose lines are formed with a plurality of nozzles, i.e. first, second and third lines [i.e. lines are formed with a plurality of dots] are formed with first, second and third nozzles**); storing the correction values for the lines (**i.e. memory means for storing a calibration line representing correlation between an amount of ink discharged and a density of an ink dot formed, col 5, lines 5-14**).

Inoue ‘688 reference and Wada ‘178 reference are combinable because both references are in the same field of endeavor of teaching correction of amount of ink discharged by the print head.

Having a printing system of Inoue’ 688 reference and then given the well-established teaching of Wada’ 178 reference, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the printing system of Inoue’ 688 reference to include “a first one of the plurality of lines formed with a first one of the plurality of nozzles being adjacent to a second one of the plurality of lines

formed with a second one of the plurality of nozzles; and the controller storing the correction values for the lines" as taught by Wada' 178 reference. The motivation for doing so would have been to improve the efficiency of the printing system for line density, or ink amount, or darkness measurement with respect to individual line (col 2, line 20-32) and thus for the line calibration or correction for better image quality reproduction (col 2, lines 52 to col 3, line 11), and further the services provided could easily be established for one another with predictable results.

Regarding claim 2, in accordance with claim 1.

Inoue discloses wherein a plurality of the lines are formed in the intersecting direction by repeating in alternation a dot formation operation of forming dots on the medium by ejecting ink from a plurality of the nozzles moving in the movement direction and a carrying operation of carrying the medium in the intersecting direction (**i.e. referring to Figs. 2, 6, 7 and 8, dots and lines are formed in the direction intersecting to the movement direction of nozzles, col 5, lines 47-61**).

Regarding claim 3, in accordance with claim 2.

Inoue discloses wherein a printing apparatus printing the image onto the medium (**i.e. referring to Fig. 6, it shows a print head printing on a recording medium**), includes a plurality of types of processing modes **(i.e. forward direction printing and backward direction printing)** for respectively executing print processes in which at least one of the carrying operation and the dot formation operation differs (**i.e. referring to Figs. 5 & 6, process of forward and backward printing and dot sizes are different, col 5, lines 47-61**);

prints, with at least two of the processing modes (**i.e. alternately printing dots in Front head or F head and Rear head or R head in SMS, or sequential multiscan system and the processes of 2-5 in col 4, lines 53-63**), a correction pattern corresponding to each of the processing modes on a medium (**i.e. density correction print pattern is composed, col 6, lines 22-35**), and has the correction values (**i.e. correcting data, col 2, lines 31-36 and correction tables in Fig. 10 and col 7, lines 54-62**), which are obtained by measuring the darkness of the correction pattern line by line, in correspondence with each line (**i.e. i.e. different gradation values, i.e. density value, reflect different darkness, i.e. gradation values 0 to 255 and 255 is completely white, col 8, line 64 to col 9, line 4, and col 1, lines 12-46, and col 2, lines 37-67**); and corrects the darkness of the image line by line, in accordance with the correction values corresponding to each line of the image, when printing the image in any of the processing modes with which the correction pattern was printed (**i.e. a forming unit for correcting read data obtained by reading the images formed by the image forming part using the correction data of the image reading part and comparing the corrected data with standard values previously set in accordance with the kinds of recording agents so as to form the processing conditions, col 2, lines 37-67**).

Regarding claim 4, in accordance with claim 3.

Inoue discloses wherein the correction pattern corresponding to each of the processing modes is printed to fit on a single medium (**i.e. in the correction of unevenness process, the correction pattern is printed in a single medium as shown in Fig. 8**).

Regarding claim 5, in accordance with claim 1.

Inoue discloses wherein a plurality of the nozzles is lined up along the intersecting direction to constitute a nozzle row **(i.e. referring to Fig. 7, nozzle movement direction intersecting cloth feeding direction)**.

Regarding claim 6, in accordance with claim 5.

Inoue discloses wherein a printing apparatus printing the image onto the medium comprises the nozzle row for each color of ink **(i.e. the printer of Fig. 1 has print heads each has nozzles for each color, col 4,lines 20-40)**; the correction value is prepared for each of the colors by printing the correction pattern for each of the colors **(i.e. correction data and correction table are prepared for each nozzle and color because of gradation density of each color are different, col 7, lines 57-62)**; and the darkness of the image is corrected color by color, based on the correction values for each of the colors **(i.e. since correction data and correction table are set for each nozzle or color, the darkness or gradation density correction has to be color by color, col 7, lines 57-62 and col 8, lines 31-39)**.

Regarding claim 15, in accordance with claim 1.

Inoue discloses wherein ruled lines extending along the movement direction for specifying a line during the measurement when measuring the darkness of the correction pattern line by line are formed in the correction pattern at a predetermined spacing in the intersecting direction **(i.e. referring to Figs. 8, 10, 11, and 16, correction data is based on the measurement of gradation density, or darkness of**

dots and lines are formed with dots; spacing between dots are preset, or predetermined, col 7, lines 57-65 and col 11, lines 49-57).

Regarding claim 16, in accordance with claim 1.

Inoue discloses wherein image data for printing the image is prepared (**i.e. converting the stored multi-value image data into actual print data, a print data storing device 13 for temporarily storing the print data produced by the image processing device, col 4, lines 1-10**), and the image data has a gradation value of the darkness for each dot formation unit formed on the medium (**i.e. the density of the gradation part of printed image data L is measured. The average value of 256 pixels is calculated in the printing direction in the gradation part, col 7, lines 16-21**); if a correction value is not associated with the formation units, then a creation ratio (**i.e. forming dots based on gradation value, i.e. forming dots based on correction data of gradation value, col 10, lines 18-32**) corresponding to the gradation value of the formation units is read from a creation ratio table in which gradation values are associated with dot creation ratios (**i.e. referring to Fig. 10, correction table corresponding to the gradation value, or creation ratio corresponding to gradation value for forming dots, col 7, lines 57-62**), and dots are formed in the formation units on the medium in accordance with the read creation ratio (**i.e. referring to Fig. 16, 8 gradations for dots are formed, and Figs. 20 and 21 provide for more details of gradation level, col 10, lines 18-31**); and if a correction value is associated with the formation units, then when reading the creation ratio corresponding to the gradation value from the creation ratio table (**i.e. referring to Figs. 10, 16, 20 and 21,**

correction data is associated with printing, col 7, lines 56-61), the creation ratio corresponding to a value obtained by changing the gradation value by the correction value is read, and dots are formed in the formation units on the medium in accordance with the read creation ratio (**i.e. referring to Figs. 10, 16 20 and 21, correction data and correction table are set corresponding gradation value and level, col** 7,**lines 45-67**).

Regarding claim 17, in accordance with claim 1.

Claim 17 recites identical features as claim 16. Thus, arguments similar to that presented above for claim 16 are also equally applicable to claim 17.

Regarding claim 18, in accordance with claim 16.

Inoue discloses wherein the dot creation ratio indicates a proportion of a number of dots formed inside a region that has a uniform gradation value and that is provided with a predetermined number of the formation units, to that predetermined number (**referring to Fig. 8, and 16, correction pattern has more than 2 bands and each has uniform gradation value; that is, number of dots are formed inside a region having uniform gradation value, col 12, lines 10-21**).

Regarding claim 19, in accordance with claim 1.

Claim 19 recites identical features as claim 18. Thus, arguments similar to that presented above for claim 18 are also equally applicable to claim 19.

Regarding claim 20, in accordance with claim 19.

Inoue discloses wherein an average value, across all lines, of darkness measurement values measured line by line is taken as a target value of darkness (**i.e.**

the density of the gradation part of printed image data L is measured. The average value of 256 pixels is calculated in the printing direction in the gradation part, col 7, lines 16-21); and a correction ratio obtained by dividing a deviation between this target value (**i.e. standard value**) and the darkness measurement value of each line by the target value is taken as the correction value (**i.e. preparing the correction data using a standard value corresponding to the kind of a recording agent for printing a pattern, col 2, lines 55-67**).

Regarding claim 21, in accordance with claim 16.

Inoue discloses wherein the nozzles can form dots of a plurality of sizes (**i.e. BJ type printer forms dots and size of dots are not equal, col 11, lines 18-24**); and the relation between the creation ratios and the gradation values is given for each of the sizes in the creation ratio table (**i.e. referring to Figs. 10, 16, 20 and 21, teach different gradation values and dots having different diameters are generated, col 5, lines 44-61**).

Regarding claim 22, in accordance with claim 1.

Inoue discloses wherein a darkness of the correction pattern is measured optically using a darkness measurement device (**i.e. "the density of the gradation part of printed image data L is measured", that is, the darkness of correction patter must be measured by an optical device, i.e. a scanner, a reading device of Fig. 22 and Fig. 23, col 13, lines 4-24**).

Regarding claim 23, in accordance with claim 3.

Inoue discloses wherein the print processes (**i.e. forward printing vs. backward printing**) in which the carrying operation differs from one another are print processes in which the pattern according to which the carry amount of each carrying operation changes is different from one another (**i.e. the printing processes of forward and backward are different to each other, i.e. dot size are different as shown in Fig. 6, this indicates that the carry amount is different in between these processes, col 5, lines 44-62**); and the print processes in which the dot formation operation differs from one another are print processes in which the pattern according to which the nozzles that is used in each dot formation operation changes is different from one another (**as discussed above, dot formation in forward printing is different than the backward printing as shown in Fig. 6**).

Regarding claim 28, in accordance with claim 17.

Inoue discloses wherein the dot creation ratio indicates a proportion of a number of dots formed inside a region that has a uniform gradation value and that is provided with a predetermined number of the formation units, to that predetermined number (**i.e. referring to Fig. 8, and 16, correction pattern has more than 2 bands and each has uniform gradation value; that is, number of dots are formed inside a region having uniform gradation value, col 12, lines 10-21 and the reference gradation pattern is configured by eight gradations as shown in FIG. 16**, **i.e. predetermined forming unit of 8, col 10, lines 18-32**).

Regarding claim 29, in accordance with claim 17.

Claim 29 recites identical features as claim 21. Thus, arguments similar to that presented above for claim 21 are also equally applicable to claim 29.

3. Claims 7, 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al (US 6,354,688) in view of Wada et al (US 6,270,178) as applied to claim 3 above, and in view of Otsuki (US 2002/0175962)

Regarding claim 7, in accordance with claim 3.

Inoue discloses printing image data on a medium intersecting the movement direction of nozzle **(i.e. cloth feeding direction is intersecting the movement direction of nozzles as shown in Fig. 7, col 6, lines 1-18)**.

Inoue does not disclose wherein the at least two processing modes include at least either a downstream edge processing mode for printing an image at an edge portion on a downstream side, with respect to the intersecting direction, of the medium, and an upstream edge processing mode for printing an image at an edge portion on an upstream side, with respect to the intersecting direction, of the medium.

In the same field of endeavor, Otsuki teaches wherein the at least two processing modes include at least either a downstream edge processing mode for printing an image at an edge portion on a downstream side, with respect to the intersecting direction, of the medium , and an upstream edge processing mode for printing an image at an edge portion on an upstream side, with respect to the intersecting direction, of the

medium (**i.e. referring to Figs. 2, 4 and 6 for both lower and upper edge printing process, Par. 93-94**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Inoue to include that the at least two processing modes include at least either a downstream edge processing mode for printing an image at an edge portion on a downstream side, with respect to the intersecting direction, of the medium, and an upstream edge processing mode for printing an image at an edge portion on an upstream side, with respect to the intersecting direction, of the medium as taught by Otsuki to improve printing quality of printing image on an edge, i.e. upper or lower or transition area, with a predictable result.

Regarding claim 10, in accordance with claim 7.

Inoue discloses printing the correction pattern (**i.e. referring to Fig. 8, example of density correcting patterns, and printing a pattern with correction data, col 2, lines 55-60**).

Inoue does not teach wherein the upstream edge processing mode is printed at the edge portion on the upstream side of the medium.

Otsuki teaches wherein the upstream edge processing mode is printed at the edge portion on the upstream side of the medium (**i.e. referring to Figs. 2, 4 and 6 for both lower and upper edge printing process, Par. 93-94**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Inoue to include that the upstream edge processing mode is printed at the edge portion on the upstream side of the medium as

taught by Otsuki to improve printing quality of printing image on an edge, i.e. upper or lower or transition area with a predictable result.

Regarding claim 11, in accordance with claim 7.

Inoue discloses printing the correction pattern (**i.e. referring to Fig. 8, example of density correcting patterns, and printing a pattern with correction data, col 2, lines 55-60**).

Inoue does not teach wherein the upstream edge processing mode is printed at the edge portion on the downstream side of the medium.

Otsuki teaches wherein the downstream edge processing mode is printed at the edge portion on the downstream side of the medium (**i.e. referring to Figs. 2, 4 and 6 for both lower and upper edge printing process, Par. 93-94**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Inoue to include that the downstream edge processing mode is printed at the edge portion on the upstream side of the medium as taught by Otsuki to improve printing quality of printing image on an edge, i.e. upper or lower or transition area with a predictable result.

Regarding claim 12, in accordance with claim 7.

Inoue discloses printing an image on a medium with respect to the intersecting direction (**i.e. cloth feeding direction is intersecting the movement direction of nozzles as shown in Fig. 7, col 6, lines 1-18**).

Inoue does not teach wherein the at least two processing modes include an intermediate processing mode for printing an image on a portion between the edge

portion on the upstream side of the medium and the edge portion on the downstream side of the medium.

Otsuki teaches wherein the at least two processing modes include an intermediate processing mode for printing an image on a portion between the edge portion on the upstream side of the medium and the edge portion on the downstream side of the medium (**i.e. printing image data in the transition area, i.e. lower and upper edge contacting region, Par. 10**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Inoue to include that wherein the at least two processing modes include an intermediate processing mode for printing an image on a portion between the edge portion on the upstream side of the medium and the edge portion on the downstream side of the medium as taught by Otsuki to improve printing quality of printing image on an edge, i.e. upper or lower or transition area with a predictable result.

Regarding claim 13, in accordance with claim 12.

Inoue does not teach wherein the intermediate processing mode and at least one of the downstream edge processing mode and the upstream edge processing mode have a different carry amount in the carrying operation.

Otsuki teaches wherein the intermediate processing mode and at least one of the downstream edge processing mode and the upstream edge processing mode have a different carry amount in the carrying operation (**i.e. in printing image data in the transition area, lower-edge color mode printing is executed whereby sub-scans**

are performed in a second sub-scan mode in which a maximum sub-scan feed increment is less than a maximum sub-scan feed increment of the first sub-scan mode, par 29).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Inoue to include that the intermediate processing mode and at least one of the downstream edge processing mode and the upstream edge processing mode have a different carry amount in the carrying operation as taught by Otsuki to improve printing quality of printing image on an edge, i.e. upper or lower or transition area with a predictable result.

Regarding claim 14, in accordance with claim 1.

Inoue teaches a correction value for a region that is judged; the intersecting direction of the medium on which the image is printed; this correction value is obtained by arranging the medium at a position corresponding to the region, printing the correction pattern on this medium, and measuring the darkness of this correction pattern line by line (**i.e. see the above discussions for prior arts teaching these limitations in claim 1**)

Inoue does not teach wherein there is also a correction value for a region that is judged to be further upstream than the edge portion on the upstream side, or for a region that is judged to be further downstream than the edge portion on the downstream side.

Otsuki teaches wherein there is also a correction value for a region that is judged to be further upstream than the edge portion on the upstream side, or for a region that is

judged to be further downstream than the edge portion on the downstream side (**i.e. "In the upper-edge color mode printing, color mode main scans may be preferably performed <u>at least (kc-1) times</u> alternately with sub-scans in which the plurality of single chromatic nozzle groups and specific achromatic nozzle group are used", that is a correction value for a region that is judged to be further upstream than the edge portion on the upstream side, par. 14**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Inoue to include that there is also a correction value for a region that is judged to be further upstream than the edge portion on the upstream side, or for a region that is judged to be further downstream than the edge portion on the downstream side as taught by Otsuki to improve printing quality of printing image on an edge, i.e. upper or lower or transition area with a predictable result.

4. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al (US 6,354,688) in view of Wada et al (US 6,270,178), and further in view of Otsuki (US 2002/0175962) as applied to claim 7 above, and further in view of Arima et al (US 6,692,097)

Regarding claim 8, in accordance with claim 7.

Inoue does not teach wherein the downstream edge processing mode and the upstream edge processing mode respectively are modes for printing an image provided without a margin at the edge portion.

Otsuki teaches wherein the downstream edge processing mode and the upstream edge processing mode **(i.e. referring to Figs. 2, 4 and 6 for both lower and upper edge printing process, Par. 93-94)**; and

Arima teaches printing an image provided without a margin at the edge portion (**i.e. In step SB11, it is judged whether the printing will be performed with the margin along all the edges of the printing medium or the printing is performed without the margin along a portion or all of the edges of the printing medium, col 13, lines 59-65**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Inoue to include that the downstream edge processing mode and the upstream edge processing mode as taught by Otsuki to improve printing quality of printing image on an edge, i.e. upper or lower or transition area; and then to modify the combination of Inoue and Otsuki to include printing an image provided without a margin at the edge portion as taught by Arima since doing so would improve the printing process in an edge area with or without a margin with a predictable result.

Regarding claim 9, in accordance with claim 7.

Inoue does not teach wherein the downstream edge processing mode and the upstream edge processing mode respectively include modes for printing an image provided with a margin at the edge portion.

Otsuki teaches wherein the downstream edge processing mode and the upstream edge processing mode (**i.e. referring to Figs. 2, 4 and 6 for both lower and upper edge printing process, Par. 93-94**); and

Arima teaches printing an image provided with a margin at the edge portion (**i.e. In step SB11, it is judged whether the printing will be performed with the margin along all the edges of the printing medium or the printing is performed without the margin along a portion or all of the edges of the printing medium, col 13, lines 59-65**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Inoue to include that the downstream edge processing mode and the upstream edge processing mode as taught by Otsuki to improve printing quality of printing image on an edge, i.e. upper or lower or transition area; and then to modify the combination of Inoue and Otsuki to include printing an image provided without a margin at the edge portion as taught by Arima since doing so would improve the printing process in an edge area with or without a margin with a predictable result.

5. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al (US 6,354,688) in view of Wada et al (US 6,270,178), Otsuki (US 2002/0175962) and Arima et al (US 6,692,097)

Inoue discloses a printing method for printing an image onto a medium, the method comprising:

printing a correction pattern by ejecting ink from a plurality of nozzles moving in a predetermined movement direction and forming, in an intersecting direction intersecting the movement direction, a plurality of lines extending along the movement direction and constituted by a plurality of dots (**limitations, i.e. method steps in this part are substantially corresponds to the method steps of claim 1. Thus, the limitations in this part are rejected as set forth above for claim 1**), a first one of the plurality of lines formed with a first one of the plurality of nozzles being adjacent to a second one of the plurality of lines formed with a second one of the plurality of nozzles; obtaining correction values that respectively correspond to the lines by measuring a darkness of the correction pattern line by line (**limitations, i.e. method steps in this part are substantially corresponds to the method steps of claim 1. Thus, the limitations in this part are rejected as set forth above for claim 1**); storing the correction values for the lines, respectively (**limitations, i.e. method steps in this part are substantially corresponds to the method steps of claim 1. Thus, the limitations in this part are rejected as set forth above for claim 1**); and printing the image with a plurality of the lines formed in the intersecting direction, while correcting the darkness of each line in accordance with correction values each corresponding to the darkness of each of the measured lines (**limitations, i.e. method steps in this part are substantially corresponds to the method steps of claim 1. Thus, the limitations in this part are rejected as set forth above for claim 1**); and

wherein a plurality of the lines are formed in the intersecting direction by repeating in alternation a dot formation operation of forming dots on the medium by ejecting ink from

a plurality of the nozzles moving in the movement direction and a carrying operation of carrying the medium in the intersecting direction (**limitations, i.e. method steps in this part are substantially corresponds to the method steps of claim 2. Thus, the limitations in this part are rejected as set forth above for claim 2**); and

a printing apparatus printing the image onto the medium, includes a plurality of types of processing modes for respectively executing print processes in which at least one of the carrying operation and the dot formation operation differs; prints, with at least two of the processing modes, a correction pattern corresponding to each of the processing modes on a medium, and has the correction values, which are obtained by measuring the darkness of the correction pattern line by line, in correspondence with each line; and corrects the darkness of the image line by line, in accordance with the correction values corresponding to each line of the image, when printing the image in any of the processing modes with which the correction pattern was printed (**limitations, i.e. method steps in this part are substantially corresponds to the method steps of the method in claim 3. Thus, the limitations in this part are rejected as set forth above for claim 3**); and

the correction pattern corresponding to each of the processing modes is printed to fit on a single medium (**limitations, i.e. method steps in this part are substantially corresponds to the method steps of claim 4. Thus, the limitations in this part are rejected as set forth above for claim 4**); and

a plurality of the nozzles is lined up along the intersecting direction to constitute a nozzle row (**limitations, i.e. method steps in this part are substantially**

corresponds to the method steps of claim 5. Thus, the limitations in this part are rejected as set forth above for claim 5); and

a printing apparatus printing the image onto the medium comprises the nozzle row for each color of ink, the correction value is prepared for each of the colors by printing the correction pattern for each of the colors, and the darkness of the image is corrected color by color, based on the correction values for each of the colors **(limitations, i.e. method steps in this part are substantially corresponds to the method steps of claim 6. Thus, the limitations in this part are rejected as set forth above for claim 6)**; and

the at least two processing modes include at least either a downstream edge processing mode for printing an image at an edge portion on a downstream side, with respect to the intersecting direction, of the medium, or an upstream edge processing mode for printing an image at an edge portion on an upstream side, with respect to the intersecting direction, of the medium **(limitations, i.e. method steps in this part are substantially corresponds to the method steps of claim 7. Thus, the limitations in this part are rejected as set forth above for claim 7)**; and

the downstream edge processing mode and the upstream edge processing mode respectively are modes for printing an image provided without a margin at the edge portion **(limitations, i.e. method steps in this part are substantially corresponds to the method steps of the method in claim 18. Thus, the limitations in this part are rejected as set forth above for claim 18)**; and

the correction pattern printed by the upstream edge processing mode is printed at the

edge portion on the upstream side of the medium; the correction pattern printed by the downstream edge processing mode is printed at the edge portion on the downstream side of the medium (**limitations, i.e. method steps in this part are substantially corresponds to the method steps of claim 10. Thus, the limitations in this part are rejected as set forth above for claim 10**); and

the at least two processing modes include an intermediate processing mode for printing an image on a portion between the edge portion on the upstream side of the medium and the edge portion on the downstream side of the medium with respect to the intersecting direction (**limitations, i.e. method steps in this part are substantially corresponds to the method steps of claim 12. Thus, the limitations in this part are rejected as set forth above for claim 12**); and

the intermediate processing mode and at least one of the downstream edge processing mode and the upstream edge processing mode have a different carry amount in the carrying operation (**limitations, i.e. method steps in this part are substantially corresponds to the method steps of claim 13. Thus, the limitations in this part are rejected as set forth above for claim 13**); and

there is also a correction value for a region that is judged to be further upstream than the edge portion on the upstream side, or for a region that is judged to be further downstream than the edge portion on the downstream side in the intersecting direction of the medium on which the image is printed; and this correction value is obtained by arranging the medium at a position corresponding to the region, printing the correction pattern on this medium, and measuring the darkness of this correction pattern line by

line (**limitations, i.e. method steps in this part are substantially corresponds to the method steps of claim 14. Thus, the limitations in this part are rejected as set forth above for claim 14**); and

ruled lines extending along the movement direction for specifying a line during the measurement when measuring the darkness of the correction pattern line by line are formed in the correction pattern at a predetermined spacing in the intersecting direction (**limitations, i.e. method steps in this part are substantially corresponds to the method steps of claim 15. Thus, the limitations in this part are rejected as set forth above for claim 15**); and

image data for printing the image is prepared, and the image data has a gradation value of the darkness for each dot formation unit formed on the medium (**limitations, i.e. method steps in this part are substantially corresponds to the method steps of claim 16. Thus, the limitations in this part are rejected as set forth above for claim 16**); if a correction value is not associated with the formation units, then a creation ratio corresponding to the gradation value of the formation units is read from a creation ratio table in which gradation values are associated with dot creation ratios, and dots are formed in the formation units on the medium in accordance with the read creation ratio (**limitations, i.e. method steps in this part are substantially corresponds to the method steps of claim 16. Thus, the limitations in this part are rejected as set forth above for claim 16**); and if a correction value is associated with the formation units, then when reading the creation ratio corresponding to the gradation value from the creation ratio table, the creation ratio corresponding to a value obtained by changing

the gradation value by the correction value is read, and dots are formed in the formation units on the medium in accordance with the read creation ratio (**limitations, i.e. method steps in this part are substantially corresponds to the method steps of claim 16. Thus, the limitations in this part are rejected as set forth above for claim 16**); and

the dot creation ratio indicates a proportion of a number of dots formed inside a region that has a uniform gradation value and that is provided with a predetermined number of the formation units, to that predetermined number (**limitations, i.e. method steps in this part are substantially corresponds to the method steps of claim 18. Thus, the limitations in this part are rejected as set forth above for claim 18**); and

all lines in the correction pattern are printed based on the same gradation value; an average value, across all lines, of darkness measurement values measured line by line is taken as a target value of darkness (**limitations, i.e. method steps in this part are substantially corresponds to the method steps of claim 21. Thus, the limitations in this part are rejected as set forth above for claim 21**); and

and a correction ratio obtained by dividing a deviation between this target value and the darkness measurement value of each line by the target value is taken as the correction value (**limitations, i.e. method steps in this part are substantially corresponds to the method steps of claim 19. Thus, the limitations in this part are rejected as set forth above for claim 19**); and

the nozzles can form dots of a plurality of sizes, and the relation between the creation ratios and the gradation values is given for each of the sizes in the creation ratio table

(**limitations, i.e. method steps in this part are substantially corresponds to the method steps of claim 29. Thus, the limitations in this part are rejected as set forth above for claim 29**); and a darkness of the correction pattern is measured optically using a darkness measurement device (**limitations, i.e. method steps in this part are substantially corresponds to the method steps of claim 22. Thus, the limitations in this part are rejected as set forth above for claim 22**); and

the print processes in which the carrying operation differs from one another are print processes in which the pattern according to which the carry amount of each carrying operation changes is different from one another (**limitations, i.e. method steps in this part are substantially corresponds to the method steps of claim 23. Thus, the limitations in this part are rejected as set forth above for claim 23**); and

the print processes in which the dot formation operation differs from one another are print processes in which the pattern according to which the nozzles that is used in each dot " formation operation changes is different from one another (**limitations, i.e. method steps in this part are substantially corresponds to the method steps of claim 23. Thus, the limitations in this part are rejected as set forth above for claim 23**).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Kau whose telephone number is 571-270-1120 and fax number is 571-270-2120. The examiner can normally be reached on M-F, 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Moore can be reached on 571-272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Steven Kau/
Examiner, Art Unit 2625
December 15, 2009

/David K Moore/
Supervisory Patent Examiner, Art Unit 2625